PATENT ABSTRACTS OF JAPAN

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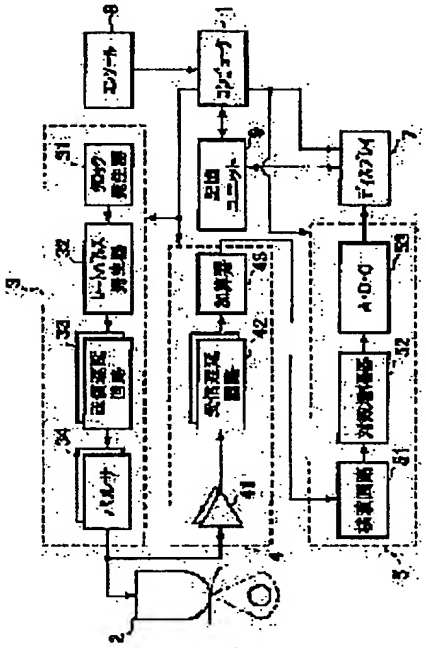
(54) ULTRASONIC DIAGNOSTIC DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To make play-back of past scanning condition and signal processing condition easier by processing echo signals obtained by ultrasonic scanning according to a desired scanning condition to generate image data on the cross section and storing the image data relating to the scanning condition and the signal processing condition.
SOLUTION: Controlled by a computer 1, a memory unit 9 to store image data generated by a B processing unit 5, etc., is made to store information of the scanning condition and the signal processing condition of the image relating the subject information to the identifier of the subject (ID code), body type, age, sexuality, and inspected part. By a console 8, the scanning condition and the signal processing condition are adjusted and first - third play-back modes can be selected. By a selected play-back mode, past operation and signal processing conditions are played back and required items selected from the played-back operation and the signal processing conditions of the past are finely adjusted to be optimum.



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CLAIMS

[Claim(s)]
[Claim 1] The ultrasonic diagnostic equipment characterized by providing a scan means to scan the cross section in analyte ultrasonically according to desired scan conditions, a signal-processing means to carry out signal processing of the echo signal acquired by said scan according to desired signal-processing conditions, and to generate the image data about said cross section, and a storage means to associate said scan conditions and said signal-processing conditions, and to memorize said image data.
[Claim 2] The ultrasonic diagnostic equipment according to claim 1 carry out having further the means which reads image data from said storage means alternatively, and indicates by playback, and a means controls said scan means and said signal-processing means according to the scan conditions and the signal-processing conditions related with said image data by which it is indicated by playback, and generate and display the image data of the same scan conditions as said image data by which it is indicated by playback, and signal-processing conditions as the description.
[Claim 3] The ultrasonic diagnostic equipment according to claim 1 characterized by to have further the means which indicates by list two or more scan conditions and signal-processing conditions which were memorized by said storage means, a means specify alternatively the scan conditions and the signal-processing conditions of arbitration out of two or more of said scan conditions by which it was indicated by list, and signal-processing conditions, and a means control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
[Claim 4] The ultrasonic diagnostic equipment according to claim 1 characterized by what the identifier information about said analyte is related with said storage means by said image data besides said scan conditions and signal-processing conditions, and is memorized.
[Claim 5] The ultrasonic diagnostic equipment according to claim 4 characterized by to have further the means which indicates the past scan conditions and signal-processing conditions about the same analyte by list according to said identifier information, a means specify alternatively the scan conditions and the signal-processing conditions of arbitration out of said scan conditions by which it was indicated by the list, and signal-processing conditions, and a means control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
[Claim 6] The ultrasonic diagnostic equipment according to claim 1 characterized by relating with said image data two or more item information related with said storage means besides said scan conditions and signal-processing conditions at least in the physique of said analyte, age, sex, and the Banking Inspection Department, and memorizing it.
[Claim 7] The means which indicates the past scan conditions and signal-processing conditions by list according to at least one item in said two or more item information, A means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said scan conditions by which it was indicated by the list, and signal-processing conditions, The ultrasonic diagnostic equipment according to claim 6 characterized by having further a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the ultrasonic diagnostic equipment which scans the interior of analyte ultrasonically and generates an ultrasonic image based on the acquired echo signal.
[0002]
[Description of the Prior Art] Many latest ultrasonic diagnostic equipments are equipped with the preset feature. This preset feature is a very convenient function which can reproduce the operating state of equipment in the condition of having sometimes used in the past, when a presetting carbon button is pushed. In addition, it depends according to the signal-processing conditions in connection with signal processing and image display, such as an STC pattern (Sensitive Time Control pattern) showing a frame rate, the depth of focus, visual field depth, an angle of visibility, the scan conditions further in connection with ultrasound scans, such as ultrasonic scanning density, and gain and the gain of each depth, and a dynamic range, and the operating state of equipment is decided.
[0003] The problems of this preset feature are the number of channels, and that there are few scans which can be registered, and signal-processing conditions, when it puts in another way. Generally, the present condition is less than 2 or 3 channels and at most ten channels.
[0004] However, it is not said simply that what is necessary is just to increase the number of channels of this preset feature, either. Although it is easy as the main reason to increase to 100 channels, the correspondence relation becomes [what kind of conditions are registered into which channel, and] very unclear, and it is raised on the contrary that the convenience falls.
[0005] There is a possibility that the following problems may arise according to it since the preset feature is prepared only for several channels by such reason. As opposed to the patient who had inspected in the past for example, on the same conditions as a scan and signal-processing conditions of the patient's past Although request of wanting to conduct this inspection is very strong, if the past conditions are not registered, this image is displayed as the past image side by side, and it is necessary to adjust a monograph affair item delicately in order, referring to the image of the past, and very troublesome. Moreover, it is necessary to optimize synthetically two or more items which constitute a scan and signal-processing conditions at the time of having not memorized the past image, or the time of a first-medical-examination patient, and this activity is still more troublesome.
[0006]
[Problem(s) to be Solved by the Invention] The purpose of this invention reproduces a past scan and past signal-processing conditions simply, or is to offer the ultrasonic diagnostic equipment which can optimize a scan and signal-processing conditions easily.
[0007]
[Means for Solving the Problem] (1) This invention is characterized by providing a scan means to scan the cross section in analyte ultrasonically according to desired scan conditions, a signal-processing means to carry out signal processing of the echo signal acquired by said scan according to desired signal-processing conditions, and to generate the image data about said cross section, and a storage

means to associate said scan conditions and said signal-processing conditions, and to memorize said image data.
(2) This invention carries out having further the means which reads image data alternatively from a storage means, and indicates by playback in the equipment of (1), and a means control said scan means and said signal-processing means according to the scan conditions and the signal-processing conditions related with said image data by which it is indicated by playback, and generate and display the image data of the same scan conditions as said image data by which it is indicated by playback, and signal-processing conditions as the description.
(3) A means by which this invention indicates by list two or more scan conditions and signal-processing conditions which were memorized by the storage means in the equipment of (1), It is characterized by having further a means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said two or more scan conditions by which it was indicated by the list, and signal-processing conditions, and a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
(4) This invention is characterized by the identifier information about said analyte being associated and memorized by said image data besides said scan conditions and signal-processing conditions in the equipment of (1) at a storage means.
(5) A means by which this invention indicates the past scan conditions and signal-processing conditions about the same analyte by list in the equipment of (4) according to identifier information, It is characterized by having further a means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said scan conditions by which it was indicated by the list, and signal-processing conditions, and a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
(6) This invention is characterized by relating with said image data two or more item information related at least with the physique of said analyte, age, sex, and the Banking Inspection Department besides said scan conditions and signal-processing conditions, and memorizing it in the equipment of (1) at a storage means.
(7) A means by which this invention indicates the past scan conditions and signal-processing conditions by list in the equipment of (6) according to at least one item in two or more item information, It is characterized by having further a means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said scan conditions by which it was indicated by the list, and signal-processing conditions, and a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
[0008]
[Embodiment of the Invention] Hereafter, with reference to a drawing, a desirable operation gestalt explains the ultrasonic diagnostic equipment by this invention. The configuration of the ultrasonic diagnostic equipment applied to this operation gestalt at drawing 1 is shown. This equipment consists of the ultrasonic probe 2, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, a display 7, a console 8, and a storage unit 9 by using a computer 1 as a control center.
[0009] In addition, you may be for convenience here with other modes, such as a harmonic image mode which extracts the color flow mapping mode and harmonic content which express spatial distribution of the M mode and the Doppler mode in which time amount change of frequency spectrum is offered of explanation, a blood flow, etc., with mean velocity etc. although only the B mode (tomographic image) is shown, and is converted into a video signal.
[0010] Two or more oscillating components, such as a piezo-electric ceramic, are arranged by the amount of [of the ultrasonic probe 2] point-dimensional [1] or two-dimensional. As this probe 2, it is good by the type of arbitration, such as a sector type, a linear type, and a convex type.
[0011] The transmitting unit 3 consists of the clock generation machine 31, a rate pulse generator 32, a transmitting delay circuit 33, and a pulser 34. The rate pulse for determining the transmitting rate (count of per-second transmission) of a supersonic wave from the rate pulse generator 32 according to the clock oscillated from the clock generation machine 31 is outputted. This rate pulse is delayed suitably in the

transmitting delay circuit 33, and is given to a pulser 34 as a trigger pulse. Synchronizing with this trigger pulse, the electrical-potential-difference pulse of a RF is impressed to a probe 2 from a pulser 34.

[0012] The oscillating component of a probe 2 vibrates mechanically in response to this electrical-potential-difference pulse. Thereby, a supersonic wave is transmitted to analyte. This supersonic wave spreads in the living body, and reflects it one after another in the surface of discontinuity of the acoustic impedance in that middle. The echo by this reflection comes to a probe 2 on the contrary, and vibrates an oscillating component mechanically. Thereby, a feeble electrical signal occurs for an oscillating component. This electrical signal is incorporated by the receiving unit 4. The receiving unit 4 consists of pre amplifier 41, a receiving delay circuit 42, and an adder 43. The electrical signal from a probe 2 is first amplified by pre amplifier 41, is delayed suitably in the receiving delay circuit 42, and is added with an adder. The input signal which had directivity by this is generated.
[0013] The B mode processing unit 5 consists of a detector circuit 51, a logarithmic amplifier 52, and an analog-digital converter (A-D-C) 53. A detector circuit 51 detects the input signal from the receiving unit 4. the logarithmic amplifier 52 -- this detection signal -- a logarithm -- it amplifies (logarithmic compression). an analog-digital converter 53 -- a logarithm -- the amplified detection signal is changed into a digital signal. A display 7 displays a tomogram based on this digital signal.
[0014] While the storage unit 9 memorizes the image data generated in the B mode processing unit 5 grade according to control of a computer 1 The information on the scan conditions when collecting the scan conditions supplied from the computer 1, and signal-processing conditions, i.e., the image data, to the image data, and signal-processing conditions, It is prepared in order that the patient information related at least with a patient's identifier (ID code), the physique (height, weight), age, sex, and the Banking Inspection Department may relate and memorize.
[0015] the 1- to which an operator adjusts a console 8 or it mentions the item of scan conditions or signal-processing conditions later -- it is prepared in order that an operator may choose the 3rd reappearance mode. Here, scan conditions and each of signal-processing conditions have two or more items, and the open item released by the operator is included in it. When an example of this open item is given, there are scan types, such as a scan condition; sector and a linear, a receiving focus number of stages, the center frequency of a transmitted supersonic wave, the depth of focus, an angle of visibility, visual field depth, the frame number per per second (frame rate), pulse-repetition-frequency PRF (rate frequency), ultrasonic scanning density signal-processing condition; gain, an STC pattern (gain according to depth), and a dynamic range. Of course, as a condition item, it is not limited to these.
[0016] next, the 1- the 3rd reappearance mode is explained in order. this the 1- the 3rd reappearance mode is memorized by the storage and functions according to the program code which can be performed by computer 1.
(1st reappearance mode) The example of the display screen in this 1st reappearance mode is shown in drawing 2 . the 1st reappearance mode -- for example, in order [this] to want to carry out the interpretation of radiogram of this image about a certain patient, comparing with the image of a patient's same past, and the image of a healthy person or a typical case patient, it is the same conditions as the scan with the time of collecting the past images etc., and signal-processing conditions, and it is suitable for the case where he wants to perform this scan and signal processing.
[0017] The image of a certain patient's past is reproduced on the left-hand side of the screen of drawing 2 . Then, the scan and signal-processing conditions which are related with this image data reproduced are incorporated by the computer 1. And as for a computer 1, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, and a display 7 are controlled so that scan and signal processing are performed according to a scan and signal-processing conditions of this past. In this inspection, the image data obtained on the same conditions as a past scan and past signal-processing conditions is displayed on the right-hand side of a screen as a live image.
[0018] Thus, in the 1st reappearance mode, a scan and signal-processing conditions can be easily set up similarly to the past image only by reproducing the past image.
(2nd reappearance mode) The example of the display screen in this 2nd reappearance mode is shown in

drawing 3 . The 2nd reappearance mode is suitable for the case where he wants to reproduce the scan and signal-processing conditions which were used for the past about the same patient as this inspection. If a console 8 is operated suitably, ID screen will pop up to the left upper column of a screen. Each item like a patient's identifier (ID code), a patient's physique (height, weight), age, sex, and the Banking Inspection Department is prepared in this ID screen, and data can be inputted now into the box of each [these] item from the keyboard of a console 8 etc.

[0019] If cursor is doubled and clicked to "the patient identifier (ID)" on this ID screen, the 2nd reappearance mode starts, by making the patient identifier concerned into a keyword, retrieval of the storage unit 9 will be performed and a list indication of the scan and signal-processing conditions which are related with image data with the patient identifier concerned will be given by the type name in a screen left lower column. That is, the list of the scan used by this inspection and inspection of the past about the same patient and signal-processing conditions is displayed. As array sequence of this list, the ascending order by the inspection stage may be used, you may arrange in an order from what has high operating frequency, and may arrange according to the priority specified by an operator at the time of record, and various Ruhr can be considered, for example. Moreover, as a type name, at least the medical practitioner specializing in inspection and the Banking Inspection Department may have desirable contents which express inspection time etc. with an initial, an initial, a code, etc. in simple.

[0020] If an operator specifies alternatively one of the requests in this past scan by which it was indicated by the list, and signal-processing conditions, as for a computer 1, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, and a display 7 will be controlled so that scan and signal processing are performed according to that scan and signal-processing conditions.

[0021] Moreover, if needed, an operator can tune the opening item of the arbitration in the reproduced scan and signal-processing conditions finely, and it can also be optimized more.

[0022] In addition, if an operator operates a console 8 suitably, the set point of the past scan by which it was indicated by the list by the type name and the detailed contents of the signal-processing conditions, i.e., an opening item, will be displayed in a table format, as shown in drawing 4 . If needed, this table can be opened, the detailed contents of the past scan and the signal-processing conditions can be checked, and it can utilize now as a selection criterion of a type name.

[0023] Thus, in the 2nd reappearance mode, conditions can also be easily optimized only by tuning finely the scan and signal-processing conditions which could reproduce easily the scan and signal-processing conditions which were used by inspection of this patient's past, and were reproduced. (3rd reappearance mode) The physique, an inspection part, etc. are suitable for this 3rd reappearance mode in the case where he wants to reproduce the scan and signal-processing conditions about the patient of the same past. It is fundamentally [as the display screen / as it in the 2nd scan mode shown in drawing 3] the same. If a console 8 is operated suitably, ID screen will pop up to the left upper column of a screen. Each item like a patient's identifier (ID code), a patient's physique (height, weight), age, sex, and the Banking Inspection Department is prepared in this ID screen, and data can be inputted now into the box of each [these] item from the keyboard of a console 8 etc.

[0024] If one or more subject names for which it asks are made to double, click, specify and decide cursor from the inside like the height in on this ID screen, weight, age, sex, and the Banking Inspection Department The 3rd reappearance mode starts, by making one or more specified items concerned into a keyword, retrieval of the storage unit 9 is performed and a list indication of the scan and signal-processing conditions which are related with the image data one or more specified items of whose concerned correspond is given by the type name in a screen left lower column. As array sequence of this list, like the 2nd scan mode, the ascending order by the inspection stage may be used, and you may arrange in an order from what has high operating frequency, and may arrange according to the priority specified by an operator at the time of record. . Moreover, contents as which at least the medical practitioner specializing in inspection and the Banking Inspection Department express inspection time etc. in an initial, an initial, a code, etc. in simple also as a type name are desirable.

[0025] If an operator specifies alternatively one of the requests in this scan by which it was indicated by the list, and signal-processing conditions, as for a computer 1, the transmitting unit 3, the receiving unit

4, the B mode processing unit 5, and a display 7 will be controlled so that scan and signal processing are performed according to that scan and signal-processing conditions.
[0026] Moreover, if needed, an operator can tune the opening item of the arbitration in the reproduced scan and signal-processing conditions finely, and it can also be optimized more.
[0027] Furthermore, if an operator operates a console 8 suitably, the set point of the scan by which it was indicated by the list by the type name and the detailed contents of the signal-processing conditions, i.e., an opening item, will be displayed in a table format, as shown in drawing 4 . If needed, this table can be opened, the detailed contents of the past scan and the signal-processing conditions can be checked, and it can utilize now as a selection criterion of a type name.
[0028] Thus, in the 3rd reappearance mode, conditions can also be easily optimized only by tuning finely the scan and signal-processing conditions which could reproduce easily the scan and signal-processing conditions which were used by inspection of the past whose inspection, physique, inspection part, etc. of this correspond, and were reproduced.
[0029] It cannot be overemphasized that can deform this invention variously, without being limited to an operation gestalt which has been mentioned above, and it can carry out.
[0030]
[Effect of the Invention] Since it relates with image data and scan conditions and signal-processing conditions are memorized, it comes to be able to do usage of reproducing a past scan and past signal-processing conditions, or tuning only a required item finely from a scan and signal-processing conditions of the reproduced past, and attaining optimization, in this invention.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the ultrasonic diagnostic equipment which scans the interior of analyte ultrasonically and generates an ultrasonic image based on the acquired echo signal.

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PRIOR ART

[Description of the Prior Art] Many latest ultrasonic diagnostic equipments are equipped with the preset feature. This preset feature is a very convenient function which can reproduce the operating state of equipment in the condition of having sometimes used in the past, when a presetting carbon button is pushed. In addition, it depends according to the signal-processing conditions in connection with signal processing and image display, such as an STC pattern (Sensitive Time Control pattern) showing a frame rate, the depth of focus, visual field depth, an angle of visibility, the scan conditions further in connection with ultrasound scans, such as ultrasonic scanning density, and gain and the gain of each depth, and a dynamic range, and the operating state of equipment is decided.
[0003] The problems of this preset feature are the number of channels, and that there are few scans which can be registered, and signal-processing conditions, when it puts in another way. Generally, the present condition is less than 2 or 3 channels and at most ten channels.
[0004] However, it is not said simply that what is necessary is just to increase the number of channels of this preset feature, either. Although it is easy as the main reason to increase to 100 channels, the correspondence relation becomes [what kind of conditions are registered into which channel, and] very unclear, and it is raised on the contrary that the convenience falls.
[0005] There is a possibility that the following problems may arise according to it since the preset feature is prepared only for several channels by such reason. As opposed to the patient who had inspected in the past for example, on the same conditions as a scan and signal-processing conditions of the patient's past Although request of wanting to conduct this inspection is very strong, if the past conditions are not registered, this image is displayed as the past image side by side, and it is necessary to adjust a monograph affair item delicately in order, referring to the image of the past, and very troublesome. Moreover, it is necessary to optimize synthetically two or more items which constitute a scan and signal-processing conditions at the time of having not memorized the past image, or the time of a first-medical-examination patient, and this activity is still more troublesome.

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

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MEANS

[Means for Solving the Problem] (1) This invention is characterized by providing a scan means to scan the cross section in analyte ultrasonically according to desired scan conditions, a signal-processing means to carry out signal processing of the echo signal acquired by said scan according to desired signal-processing conditions, and to generate the image data about said cross section, and a storage means to associate said scan conditions and said signal-processing conditions, and to memorize said image data.
(2) This invention carries out having further the means which reads image data alternatively from a storage means, and indicates by playback in the equipment of (1), and a means control said scan means and said signal-processing means according to the scan conditions and the signal-processing conditions related with said image data by which it is indicated by playback, and generate and display the image data of the same scan conditions as said image data by which it is indicated by playback, and signal-processing conditions as the description.
(3) A means by which this invention indicates by list two or more scan conditions and signal-processing conditions which were memorized by the storage means in the equipment of (1), It is characterized by having further a means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said two or more scan conditions by which it was indicated by the list, and signal-processing conditions, and a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
(4) This invention is characterized by the identifier information about said analyte being associated and memorized by said image data besides said scan conditions and signal-processing conditions in the equipment of (1) at a storage means.
(5) A means by which this invention indicates the past scan conditions and signal-processing conditions about the same analyte by list in the equipment of (4) according to identifier information, It is characterized by having further a means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said scan conditions by which it was indicated by the list, and signal-processing conditions, and a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
(6) This invention is characterized by relating with said image data two or more item information related at least with the physique of said analyte, age, sex, and the Banking Inspection Department besides said scan conditions and signal-processing conditions, and memorizing it in the equipment of (1) at a storage means.
(7) A means by which this invention indicates the past scan conditions and signal-processing conditions by list in the equipment of (6) according to at least one item in two or more item information, It is characterized by having further a means to specify alternatively the scan conditions and signal-processing conditions of arbitration out of said scan conditions by which it was indicated by the list, and signal-processing conditions, and a means to control said scan means and said signal-processing means according to said scan conditions and signal-processing conditions which were specified.
[0008]

[Embodiment of the Invention] Hereafter, with reference to a drawing, a desirable operation gestalt explains the ultrasonic diagnostic equipment by this invention. The configuration of the ultrasonic diagnostic equipment applied to this operation gestalt at drawing 1 is shown. This equipment consists of the ultrasonic probe 2, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, a display 7, a console 8, and a storage unit 9 by using a computer 1 as a control center.
[0009] In addition, you may be for convenience here with other modes, such as a harmonic image mode which extracts the color flow mapping mode and harmonic content which express spatial distribution of the M mode and the Doppler mode in which time amount change of frequency spectrum is offered of explanation, a blood flow, etc., with mean velocity etc. although only the B mode (tomographic image) is shown, and is converted into a video signal.
[0010] Two or more oscillating components, such as a piezo-electric ceramic, are arranged by the amount of [of the ultrasonic probe 2] point-dimensional [1] or two-dimensional. As this probe 2, it is good by the type of arbitration, such as a sector type, a linear type, and a convex type.
[0011] The transmitting unit 3 consists of the clock generation machine 31, a rate pulse generator 32, a transmitting delay circuit 33, and a pulser 34. The rate pulse for determining the transmitting rate (count of per-second transmission) of a supersonic wave from the rate pulse generator 32 according to the clock oscillated from the clock generation machine 31 is outputted. This rate pulse is delayed suitably in the transmitting delay circuit 33, and is given to a pulser 34 as a trigger pulse. Synchronizing with this trigger pulse, the electrical-potential-difference pulse of a RF is impressed to a probe 2 from a pulser 34.

[0012] The oscillating component of a probe 2 vibrates mechanically in response to this electrical-potential-difference pulse. Thereby, a supersonic wave is transmitted to analyte. This supersonic wave spreads in the living body, and reflects it one after another in the surface of discontinuity of the acoustic impedance in that middle. The echo by this reflection comes to a probe 2 on the contrary, and vibrates an oscillating component mechanically. Thereby, a feeble electrical signal occurs for an oscillating component. This electrical signal is incorporated by the receiving unit 4. The receiving unit 4 consists of pre amplifier 41, a receiving delay circuit 42, and an adder 43. The electrical signal from a probe 2 is first amplified by pre amplifier 41, is delayed suitably in the receiving delay circuit 42, and is added with an adder. The input signal which had directivity by this is generated.
[0013] The B mode processing unit 5 consists of a detector circuit 51, a logarithmic amplifier 52, and an analog-digital converter (A-D-C) 53. A detector circuit 51 detects the input signal from the receiving unit 4. the logarithmic amplifier 52 -- this detection signal -- a logarithm -- it amplifies (logarithmic compression). an analog-digital converter 53 -- a logarithm -- the amplified detection signal is changed into a digital signal. A display 7 displays a tomogram based on this digital signal.
[0014] While the storage unit 9 memorizes the image data generated in the B mode processing unit 5 grade according to control of a computer 1 The information on the scan conditions when collecting the scan conditions supplied from the computer 1, and signal-processing conditions, i.e., the image data, to the image data, and signal-processing conditions, It is prepared in order that the patient information related at least with a patient's identifier (ID code), the physique (height, weight), age, sex, and the Banking Inspection Department may relate and memorize.
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[0016] next, the 1- the 3rd reappearance mode is explained in order. this the 1- the 3rd reappearance mode is memorized by the storage and functions according to the program code which can be performed

by computer 1.
(1st reappearance mode) The example of the display screen in this 1st reappearance mode is shown in drawing 2 . the 1st reappearance mode -- for example, in order [this] to want to carry out the interpretation of radiogram of this image about a certain patient, comparing with the image of a patient's same past, and the image of a healthy person or a typical case patient, it is the same conditions as the scan with the time of collecting the past images etc., and signal-processing conditions, and it is suitable for the case where he wants to perform this scan and signal processing.
[0017] The image of a certain patient's past is reproduced on the left-hand side of the screen of drawing 2 . Then, the scan and signal-processing conditions which are related with this image data reproduced are incorporated by the computer 1. And as for a computer 1, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, and a display 7 are controlled so that scan and signal processing are performed according to a scan and signal-processing conditions of this past. In this inspection, the image data obtained on the same conditions as a past scan and past signal-processing conditions is displayed on the right-hand side of a screen as a live image.
[0018] Thus, in the 1st reappearance mode, a scan and signal-processing conditions can be easily set up similarly to the past image only by reproducing the past image.
(2nd reappearance mode) The example of the display screen in this 2nd reappearance mode is shown in drawing 3 . The 2nd reappearance mode is suitable for the case where he wants to reproduce the scan and signal-processing conditions which were used for the past about the same patient as this inspection. If a console 8 is operated suitably, ID screen will pop up to the left upper column of a screen. Each item like a patient's identifier (ID code), a patient's physique (height, weight), age, sex, and the Banking Inspection Department is prepared in this ID screen, and data can be inputted now into the box of each [these] item from the keyboard of a console 8 etc.
[0019] If cursor is doubled and clicked to "the patient identifier (ID)" on this ID screen, the 2nd reappearance mode starts, by making the patient identifier concerned into a keyword, retrieval of the storage unit 9 will be performed and a list indication of the scan and signal-processing conditions which are related with image data with the patient identifier concerned will be given by the type name in a screen left lower column. That is, the list of the scan used by this inspection and inspection of the past about the same patient and signal-processing conditions is displayed. As array sequence of this list, the ascending order by the inspection stage may be used, you may arrange in an order from what has high operating frequency, and may arrange according to the priority specified by an operator at the time of record, and various Ruhr can be considered, for example. Moreover, as a type name, at least the medical practitioner specializing in inspection and the Banking Inspection Department may have desirable contents which express inspection time etc. with an initial, an initial, a code, etc. in simple.
[0020] If an operator specifies alternatively one of the requests in this past scan by which it was indicated by the list, and signal-processing conditions, as for a computer 1, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, and a display 7 will be controlled so that scan and signal processing are performed according to that scan and signal-processing conditions.
[0021] Moreover, if needed, an operator can tune the opening item of the arbitration in the reproduced scan and signal-processing conditions finely, and it can also be optimized more.
[0022] In addition, if an operator operates a console 8 suitably, the set point of the past scan by which it was indicated by the list by the type name and the detailed contents of the signal-processing conditions, i.e., an opening item, will be displayed in a table format, as shown in drawing 4 . If needed, this table can be opened, the detailed contents of the past scan and the signal-processing conditions can be checked, and it can utilize now as a selection criterion of a type name.
[0023] Thus, in the 2nd reappearance mode, conditions can also be easily optimized only by tuning finely the scan and signal-processing conditions which could reproduce easily the scan and signal-processing conditions which were used by inspection of this patient's past, and were reproduced. (3rd reappearance mode) The physique, an inspection part, etc. are suitable for this 3rd reappearance mode in the case where he wants to reproduce the scan and signal-processing conditions about the patient of the same past. It is fundamentally [as the display screen / as it in the 2nd scan mode shown in drawing 3]

the same. If a console 8 is operated suitably, ID screen will pop up to the left upper column of a screen. Each item like a patient's identifier (ID code), a patient's physique (height, weight), age, sex, and the Banking Inspection Department is prepared in this ID screen, and data can be inputted now into the box of each [these] item from the keyboard of a console 8 etc.

[0024] If one or more subject names for which it asks are made to double, click, specify and decide cursor from the inside like the height in on this ID screen, weight, age, sex, and the Banking Inspection Department The 3rd reappearance mode starts, by making one or more specified items concerned into a keyword, retrieval of the storage unit 9 is performed and a list indication of the scan and signal-processing conditions which are related with the image data one or more specified items of whose concerned correspond is given by the type name in a screen left lower column. As array sequence of this list, like the 2nd scan mode, the ascending order by the inspection stage may be used, and you may arrange in an order from what has high operating frequency, and may arrange according to the priority specified by an operator at the time of record. . Moreover, contents as which at least the medical practitioner specializing in inspection and the Banking Inspection Department express inspection time etc. in an initial, an initial, a code, etc. in simple also as a type name are desirable.

[0025] If an operator specifies alternatively one of the requests in this scan by which it was indicated by the list, and signal-processing conditions, as for a computer 1, the transmitting unit 3, the receiving unit 4, the B mode processing unit 5, and a display 7 will be controlled so that scan and signal processing are performed according to that scan and signal-processing conditions.

[0026] Moreover, if needed, an operator can tune the opening item of the arbitration in the reproduced scan and signal-processing conditions finely, and it can also be optimized more.

[0027] Furthermore, if an operator operates a console 8 suitably, the set point of the scan by which it was indicated by the list by the type name and the detailed contents of the signal-processing conditions, i.e., an opening item, will be displayed in a table format, as shown in drawing 4 . If needed, this table can be opened, the detailed contents of the past scan and the signal-processing conditions can be checked, and it can utilize now as a selection criterion of a type name.

[0028] Thus, in the 3rd reappearance mode, conditions can also be easily optimized only by tuning finely the scan and signal-processing conditions which could reproduce easily the scan and signal-processing conditions which were used by inspection of the past whose inspection, physique, inspection part, etc. of this correspond, and were reproduced.

[0029] It cannot be overemphasized that can deform this invention variously, without being limited to an operation gestalt which has been mentioned above, and it can carry out.

[0030]

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The block diagram showing the configuration of the ultrasonic diagnostic equipment concerning 1 operation gestalt of this invention.
[Drawing 2] Drawing showing the example of a screen display for explaining the 1st reappearance mode about the scan and signal-processing conditions by this operation gestalt.
[Drawing 3] Drawing showing the example of a screen display for explaining the 2nd [about the scan and signal-processing conditions by this operation gestalt], and 3rd reappearance mode.
[Drawing 4] Drawing showing the example of a list display of the scan taken up in the 2nd and 3rd reappearance mode, and a signal-processing condition candidate.
[Description of Notations]
1 -- Computer,
2 -- Ultrasonic probe,
3 -- Transmitting unit,
4 -- Receiving unit,
5 -- B mode processing unit,
7 -- Display,
8 -- Console,
9 -- Record unit,
31 -- Clock generation machine,
32 -- Rate pulse generator,
33 -- Transmitting delay circuit,
34 -- Pulser,
41 -- Pre amplifier,
42 -- Receiving delay circuit,
43 -- Adder,
51 -- Detector circuit,
52 -- Logarithmic amplifier,
53 -- Analog-digital converter,
71 -- Digital scan converter,
72 -- Look-up table,
73 -- Digital-to-analog converter,
74 -- Color display.

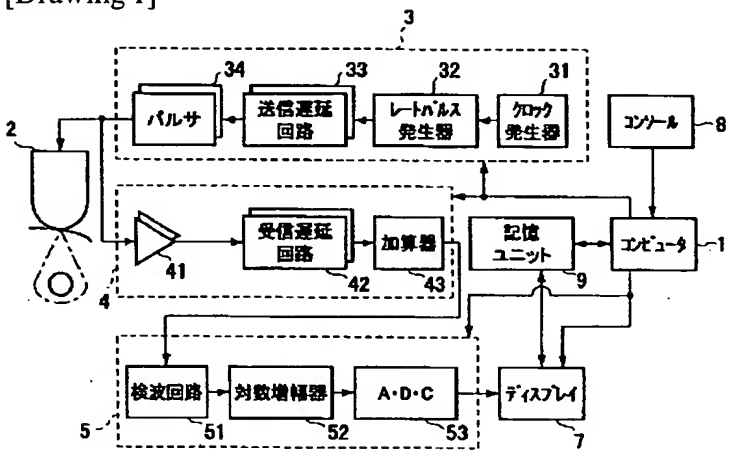
[Translation done.]

* NOTICES *

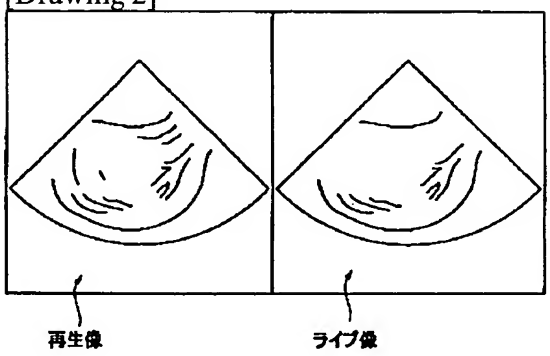
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

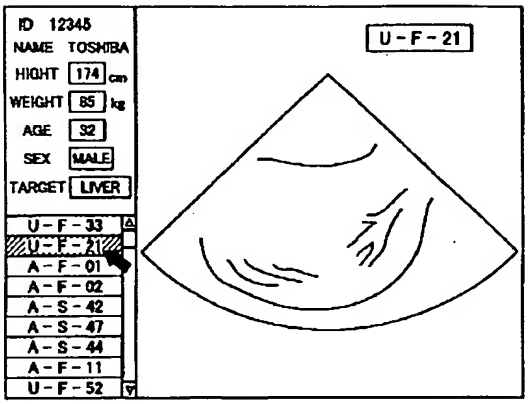
[Drawing 1]



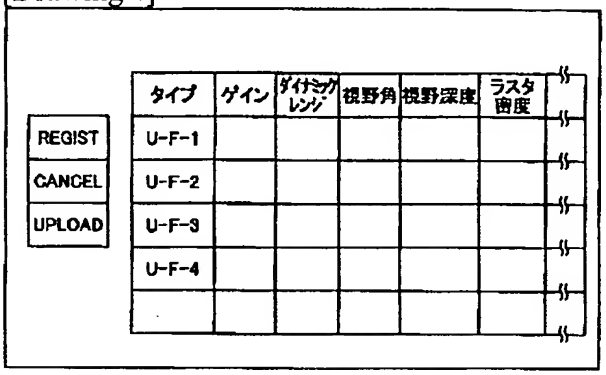
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]